

# BEST AVAILABLE COPY

U.S. Patent Serial No. 09/941,982

## AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims:

b1 Claim 1 (Currently Amended) A method of forming a nitride-based semiconductor layer, comprising the steps of:

growing a buffer layer of  $\text{Al}_x\text{Ga}_{1-x}\text{N}$  ( $0 \leq x \leq 1$ ) on a substrate at a growth rate of at least  $[[7]]$   $16 \text{ \AA/sec}$ ; and

growing a nitride-based semiconductor layer of  $\text{Al}_a\text{B}_b\text{In}_c\text{Tl}_d\text{Ga}_{1-a-b-c-d}\text{N}$  ( $0 \leq a < 1$ ,  $0 \leq b < 1$ ,  $0 \leq c < 1$ ,  $0 \leq d < 1$ ,  $a+b+c+d < 1$ ) on said buffer layer, wherein

said step of growing the buffer layer comprises growing said buffer layer to have a film thickness in the range from  $50 \text{ \AA}$  to  $300 \text{ \AA}$ .

Claim 2 (Original) The method of forming a nitride-based semiconductor layer according to claim 1, wherein

said step of growing the buffer layer comprises growing said buffer layer at a growth rate

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of at most 51 Å/sec.

Claim 3 (Currently Amended) The method of forming a nitride-based semiconductor layer according to claim 1, wherein

said step of growing the buffer layer comprises growing said buffer layer at a growth rate ~~in the range from 16 Å/sec to~~ of at most 42 Å/sec.

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Claim 4 (Original) The method of forming a nitride-based semiconductor layer according to claim 1, wherein

said step of growing the buffer layer comprises growing said buffer layer at a growth rate in the range from 25 Å/sec to 29 Å/sec.

Claim 5 (Original) The method of forming a nitride-based semiconductor layer according to claim 1, wherein

said step of growing the buffer layer comprises adjusting the growth rate of said buffer layer by the supply amount of a group III element supplied at the time of growing said buffer layer.

Claim 6 (Canceled)

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Claim 7 (Original) The method of forming a nitride-based semiconductor layer according to claim 1, wherein

said step of growing the buffer layer comprises growing said buffer layer to have a film thickness in the range from 100 Å to 200 Å.

Claim 8 (Original) The method of forming a nitride-based semiconductor layer according to claim 1, wherein

said step of growing the buffer layer comprises growing said buffer layer at a substrate temperature in the range from 500° C to 700° C.

Claim 9 (Original) The method of forming a nitride-based semiconductor layer according to claim 1, wherein

said step of growing the buffer layer comprises growing said buffer layer at a substrate temperature in the range from 550° C to 650° C.

Claim 10 (Currently Amended) A method of manufacturing a nitride-based semiconductor device, comprising the steps of:

growing a buffer layer of  $\text{Al}_x\text{Ga}_{1-x}\text{N}$  ( $0 \leq x \leq 1$ ) on a substrate at a growth rate of at least  $[[7]]$  16 Å/sec; and

growing a nitride-based semiconductor layer including an active device region on said buffer layer and made of  $\text{Al}_a\text{B}_b\text{In}_c\text{Tl}_d\text{Ga}_{1-a-b-c-d}\text{N}$  ( $0 \leq a < 1$ ,  $0 \leq b < 1$ ,  $0 \leq c < 1$ ,  $0 \leq d < 1$ ,  $a+b+c+d < 1$ ) on

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said buffer layer, wherein

said step of growing the buffer layer comprises growing said buffer layer to have a film thickness in the range from 50 Å to 300 Å.

Claim 11 (Original) The method of manufacturing a nitride-based semiconductor device according to claim 10, wherein

said step of growing the buffer layer comprises growing said buffer layer at a growth rate of at most 51 Å/sec

Claim 12 (Currently Amended) The method of manufacturing a nitride-based semiconductor device according to claim 10, wherein

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said step of growing the buffer layer comprises growing said buffer layer at a growth rate in the range from 16 Å/sec to of at most 42 Å/sec.

Claim 13 (Original) The method of manufacturing a nitride-based semiconductor device according to claim 10, wherein

said step of growing the buffer layer comprises growing said buffer layer at a growth rate in the range from 25 Å/sec to 29 Å/sec.

Claim 14 (Original) The method of manufacturing a nitride-based semiconductor device according to claim 10, wherein

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said step of growing the buffer layer comprises adjusting the growth rate of said buffer layer by adjusting the supply amount of a group III element supplied at the time of growing said buffer layer.

Claim 15 (Canceled)

Claim 16 (Original) The method of manufacturing a nitride-based semiconductor device according to claim 10, wherein

said step of growing the buffer layer comprises growing said buffer layer at a substrate temperature in the range from 500° C. to 700° C.

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Claim 17 (Original) The method of manufacturing a nitride-based semiconductor device according to claim 10, wherein

said step of growing the nitride-based semiconductor layer comprises forming as said active device region a light emitting layer or an active layer in a semiconductor light emitting device, a core layer in a waveguide device, an I layer in a PIN photodiode, a pn junction portion in a photodiode or a hetero-junction bipolar transistor or a channel portion in a field effect transistor.

Claim 18 (Original) The method of manufacturing a nitride-based semiconductor device

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according to claim 10, wherein

said step of growing the nitride-based semiconductor layer comprises forming a cladding layer of a first conductivity type, an active layer and a cladding layer of a second conductivity type in this order.

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